D 301.81 ; 30/9

Combat Crew

strategic air command

SEPTEMBER 1980

Combat Crew

Magazine of the Strategic Air Command - 31st Year of Publication

GEN. RICHARD H. ELLIS
COMMANDER IN CHIEF, SAC

BRIG. GEN. HAROLD J. M. WILLIAMS
Inspector General

COL. RICHARD A. PATRICK
Director of Safety

STAFF

CAPT. ROSS W. PHILLIPPE
Editor
G. FRANCIS FARRELL
Associate Editor
SSgt. RICHARD L. WALDROOP
Art Editor
MARY JANE ABBOUD
Editorial Assistant

IN THIS ISSUE

Missile Warning 4
TA/EVS 7
Old Heads and Retreads 8
VDP 12
MX: Deployment 14
Just Another ORI 18
CFIC Corner 22
Big Instrument 26

On Our Cover
An artist's concept of SAC's MX missile that is designed to counter a growing Soviet threat.

SACRP 127-1 **VOL. XXX NO. 9** **SEPTEMBER 1980**

COMBAT CREW is an internal publication of the Strategic Air Command with the sole purpose of promoting safety. The contents of this magazine are informative and not to be considered as directive in nature. Facts, testimony and conclusions of all mishaps printed herein may not be construed as incrimination under Article 31 of the Uniform Code of Military Justice. All names, dates and places used in conjunction with mishap stories are fictitious. Written permission must be obtained from Headquarters, Strategic Air Command, before any material may be reprinted by other than U.S. Air Force organizations. Use of funds for printing the publication has been approved by Hq. USAF, Distribution FX, controlled by IGFC. SAC units submit distribution requests through local PDO. Reader to copy ratio 9:1.

Subscriptions are available from: The Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Price: $14.00 per year domestic. $17.50 if mailed to a foreign country; or $1.20 single copy. Authority to publish this periodical automatically expires on 7 April 1982, unless its continuance is authorized by the approving authority prior to that date. Contributions are encouraged as well as comments and criticisms. Direct correspondence with the Editor is authorized. Address correspondence to Editor, COMBAT CREW, Hq SAC IGFC, Offutt AFB, Ne. 68113.

JAMES E. LIGHT, JR.
Major General, USAF
Deputy Chief of Staff, Logistics

A recent TIG Brief article titled, "Supervisors: Can You Really Affect Productivity, Morale, or Career Intent?" pointed out that one fact which has the greatest impact on a subordinate's productivity, morale, and career intent is effective supervisory communication. I certainly support this finding, not by research, but from the "school of experience." However, I believe it goes much further than just productivity, morale, and career intent. It has a direct impact on safety, reliability, effectiveness, economy and many other areas of today's managerial involvement. It is probably safe to say that many mistakes are made solely because of poor communication — a quick review of any back issue of this magazine will point that out. Not just mistakes made because of the lack of communication, but mistakes made because of a simple lack of understanding of what the instruction meant. This can be in any form; i.e., written, verbal, or for that matter, anything that affects any of our sensory capabilities. The old saying of "I know you believe you understand what you think I said, but I am not sure you realize that what you hear, is not what I meant" couldn't be more appropriate.

Safety alone would be a paramount reason for working to achieve better communication; however, it goes deeper than that. I think that most people in today's Air Force want and need adequate communication. This may be due to a part of our society where radios and televisions outnumber people. In many families, we probably average two pieces of communication equipment per person, maybe more. We know in detail what's happening in Afghanistan, yet when we get in our organizational structure, we

"PRODUCTIVITY"

a direct link to communication

find that communication is primarily verbal, spasmodic and limited to one shift. The transmission of information from top management to the last person on the ramp is probably the poorest thing we do in the Air Force. Yet, it is probably one of the most important.

This is especially true in our maintenance activities. The around-the-clock nature of maintenance and the spread-out work locations make communication a tremendous challenge. This is a challenge that must be met in the future and must be met better than it has ever been done in the past. This is where we all get involved. We must realize the necessity of good communication and take the extra effort to make sure we are understood. Follow-up your communication, and look for new and better ways to get your message to the right people and to the right place at the right time. As I mentioned, I emphasize the phrase, **we must all get involved.** Commanders must consider communication in the work process. You must realize that your communication process is lengthy and at best a difficult process.

Your instructions and directions will simply not get to all levels of your command as rapidly and accurately as you would like. If you expect results, take extra efforts to ensure information gets to all places in a timely manner. The same applies to maintenance supervisors, shop chiefs, shift chiefs, and last, but certainly not least, each individual. Each person has a responsibility to seek out proper information and not just say, "if they want me to know, they'll tell me." This is an attitude that will not assure success. We must make our people aware that communication is important. We must make them aware that there are barriers to communication. Some of these barriers are the physical distances on many of our larger bases; the barriers because of the hierarchy of power and status within the organizations; i.e., the bottom ranks do not communicate easily with the higher ranks; the natural barriers of job specialization — we don't all talk the same language or have a good base of understanding; and a natural reluctancy to release or share information because of what has sometimes been referred to as "one upmanship." We must understand these barriers, recognize when and where they exist and do our best to break them down. Only then will we have better productivity and safety.

Can communication really affect productivity? I feel certain that it has a tremendous impact in every area. Most especially in the areas of feedback to people for their efforts. Our people must receive adequate communication on what we expect them to do, and as important, they must receive the feedback and recognition that they need after they complete their work — that communication will probably make as dramatic an impact, if not a greater one on the work accomplished, than anything else. How do you provide this communication and feedback? That's the challenge — it will be different in every organization on every base. It will depend on experiences, values, number of individuals, physical facilities and a list of uncontrollable variables too long to mention. The key is to study the communication process for your location, improve it, recheck it and make it work better for you. It will be one of the most important jobs that you will ever undertake. Good luck.

The Monot[illegible]d the panic of MISSILE WARNING

TSgt William Madden
12th MWG, Thule AB

The console operator sat transfixed at the sweeping and flashing array of lights that passed before his tired eyes. The work, though sometimes boring and monotonous, was extremely important.

The operator's eyes scanned the scope but his mind was on other things: on the beach back in California where warm sea breezes blew, instead of the hurricane-like cold wind that was blowing outside.

His daydream was unexpectedly interrupted by the realization that the beams on his scope had suddenly become cluttered with unknown signals. He immediately called out the situation to the deputy space systems director, who confirmed the initiation of a no-notice exercise. Immediate crew checklist actions followed. Is this what a real world threat would be like?

A crucial part of the deterrence equation may be found some 700 miles north of the Arctic Circle at Thule AB, Greenland. SAC crews of two officers and six enlisted normally work eight-hour shifts, 24 hours a day, scanning the skies from the ballistic missile early warning system site (BMEWS). These men and women are members of the 12th Missile Warning Group (MWG), which became part of SAC on December 1, 1979.

In a small dimly lit room called the tactical operations room, or TOR, the highly trained crews are constantly watching for a potential ICBM threat against North America. Working for them are four detection radars each the size of a football field and a tracking radar housed in a radome which looks like a giant golf ball. These radars transmit powerful beams of radio frequency energy in excess of 2,000 nm into outer space. Whenever an object in space breaks the radar beam, it appears as a target on the detection radar environmental display (DRED) consoles manned by BMEWS crew personnel.

The TOR is the nerve center of the site. Missile warning and spacetrack information generated at the site and displayed in the TOR is sent back to the North American Air Defense Command (NORAD) Combat Operations Center at Cheyenne Mountain, Colorado, in a matter of seconds. There it is forwarded to the Pentagon and the SAC underground command post which control the retaliatory forces. To speed the warning information on its way, the TOR is always in direct telephone and data link contact with NORAD.

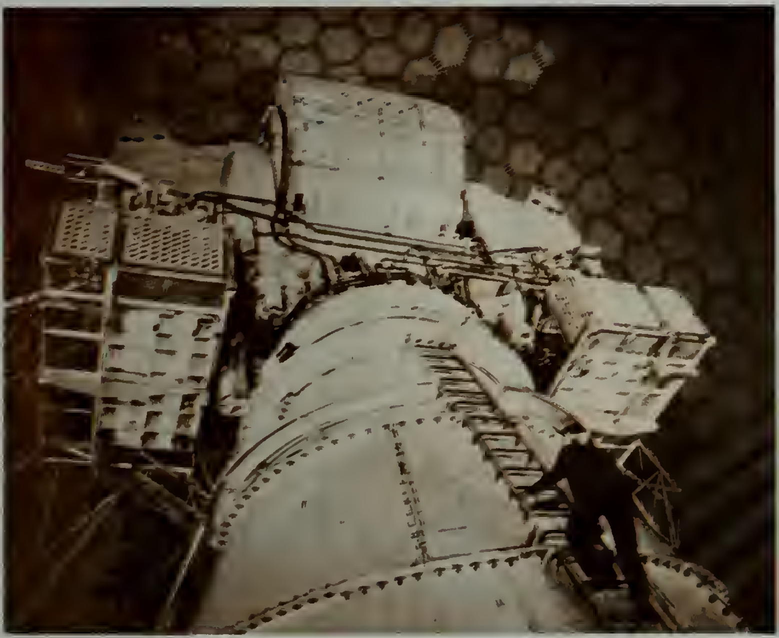
"Hours of monotony followed by moments of sheer panic," is how one space systems console operator described his job. The panic comes during the constant training exercises the crews go through to maintain proficiency. If the crews can handle the artificial stresses of an exercise, they know they are ready for the unexpected stress of a real-world threat event.

"There are 17 different training situations we could hit them with including single and multiple inputs," explained the training NCO. "You almost need four hands to do the job during some of the exercises."

Even though most of the exercises are planned, the console operators never know what is coming next or when. They have to be alert and react accordingly to each situation. The faster they react, the faster they prevent a false threat event from occurring. The TOR's main purpose is to show whether or not a false threat event has occurred. The TOR crews provide the human confirmation to the national command authorities that what they are receiving and sending is, in fact, valid information.

TSgt. Francis Mitchell types out computer cards for a training scenario for the console operators. The training exercises keep the crews proficient and break up the monotony.

The reactions of the crews are honed by all the training they receive. Before they get to Thule, crewmembers are scheduled through a seven and one-half week aerospace control and warning systems course at Keesler AFB, Miss., and an eight-day introduction to the BMEWS course



A contract worker scales the massive tracker in the radome. The tracker has the ability to maneuver and follow individual targets.

Reflections of the Ballistic Missile Early Warning System Site at Thule Air Base, Greenland.

at Peterson AFB, Colo. Additionally, some have attended an eight-week electronic countermeasures technician course at Keesler. For the first 30 days at Thule, they are trained on the operation and procedures of each piece of equipment they will operate before they can be certified for crew duty. After being certified operationally-ready for crew duty, they continually receive announced and unannounced performance evaluations and exercises to test their knowledge and skill.

It's the hours of waiting that make their job so difficult. "The sitting and waiting is the hardest part," said a senior airman. "There are no motor skills involved, so trying to keep your span of attention is difficult. You can't do anything that will detract from watching the scopes."

Winters are long, dark, cruel and cold at the Air Force's northernmost outpost. One crew was stuck at the site, which is located 12 miles from the base, for 57 long hours during the worst Arctic storm of the winter. Winds over 70 knots blew snow off Greenland's nearby icecap and reduced visibility to zero making travel between the site and base impossible. The winds and cold temperatures resulted in a −70°F wind chill factor which lasted over two days. Some of the highest recorded winds in the world have been made on the road to the site.

During these long harsh storms, activities are limited and exercises are postponed awaiting the arrival of a relief crew.

The site was built in the late fifties with the weather in mind and is nearly self-sustaining for the Air Force personnel and civilian contractors. It has a dining hall, maintenance shops, a fire department, a security police detachment and a mile-long tunnel that connects the site's 12 buildings together.

In addition to the weather, the crews must contend with the other problems associated with a remote tour, such as family separation, delays in receiving mail and the monotony of an unchallenged environment. With its far northern location, Thule is one of the most remote of Air Force installations.

As bad as it may seem, the short summer season of July and August brings temperatures into the low sixties, 24 hours a day, sending out myriads of small colorful Arctic flowers. Even grass is not uncommon. This, coupled with the excellent facilities at Thule, make the town one to remember and highlights the fact that there are often good aspects to any situation.

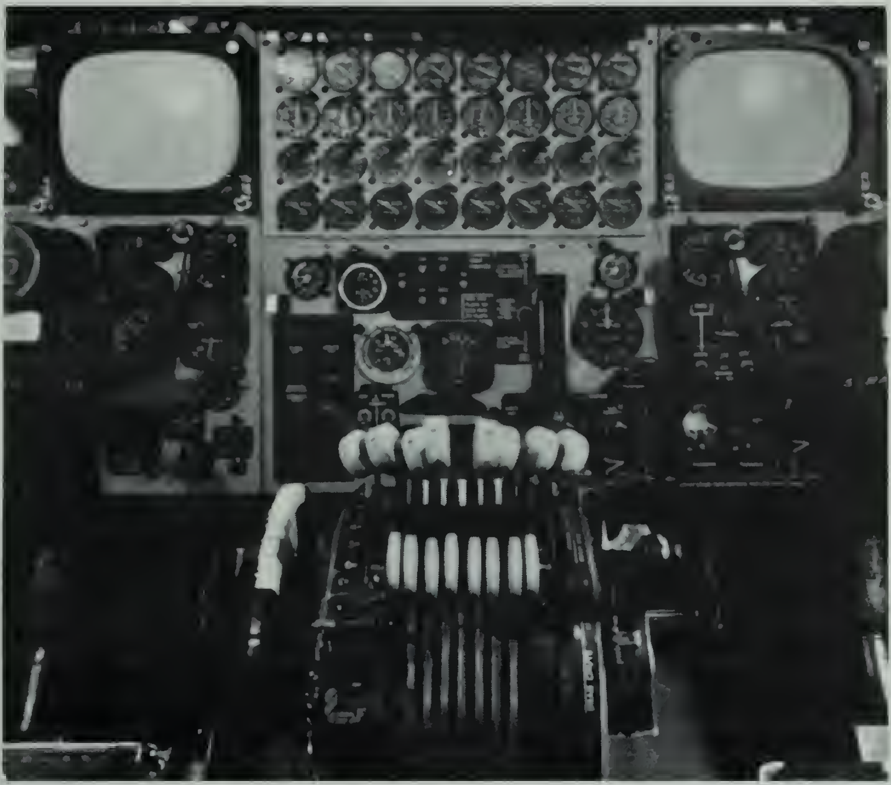
One of the operators concluded, "It might be boring at times, but it has a very important purpose: to give the United States the vital time it needs in the event of a missile attack.

Amongst the row of receivers, a contract worker explains th inner workings of the equipment to a new console operator. Fro here, false inputs are put into the system to confuse operato during exercises.

LET'S TALK TA/EVS

The following is the first in a series of TA/EVS tips offered by Capt Moore. These are techniques which he believes will help crews fly better TA. Although these tips will apply primarily to B-52 G & H crewmembers, D model crews should also benefit.

Capt Chris Moore
Chief, B-52 Aircrew Training
8AF/DOTTA
Barksdale AFB LA



ANALYZE THE ROUTE

Take an overall look at the terrain. Is it flat and/or rolling? Relatively flat areas will give you your best opportunities to calibrate and evaluate your TA equipment. Are you flying a mountainous route? This gives you an opportunity to practice crossover techniques and analyze dropout. Do ridges cross your track? These may require advance radar detection and early climbs to keep from exceeding aircraft climb capabilities. Gentle upslopes and downslopes should be noted, as their insidious effects can be particularly frustrating to the unprepared. They require constant climbs or descents to maintain specified crossing altitudes.

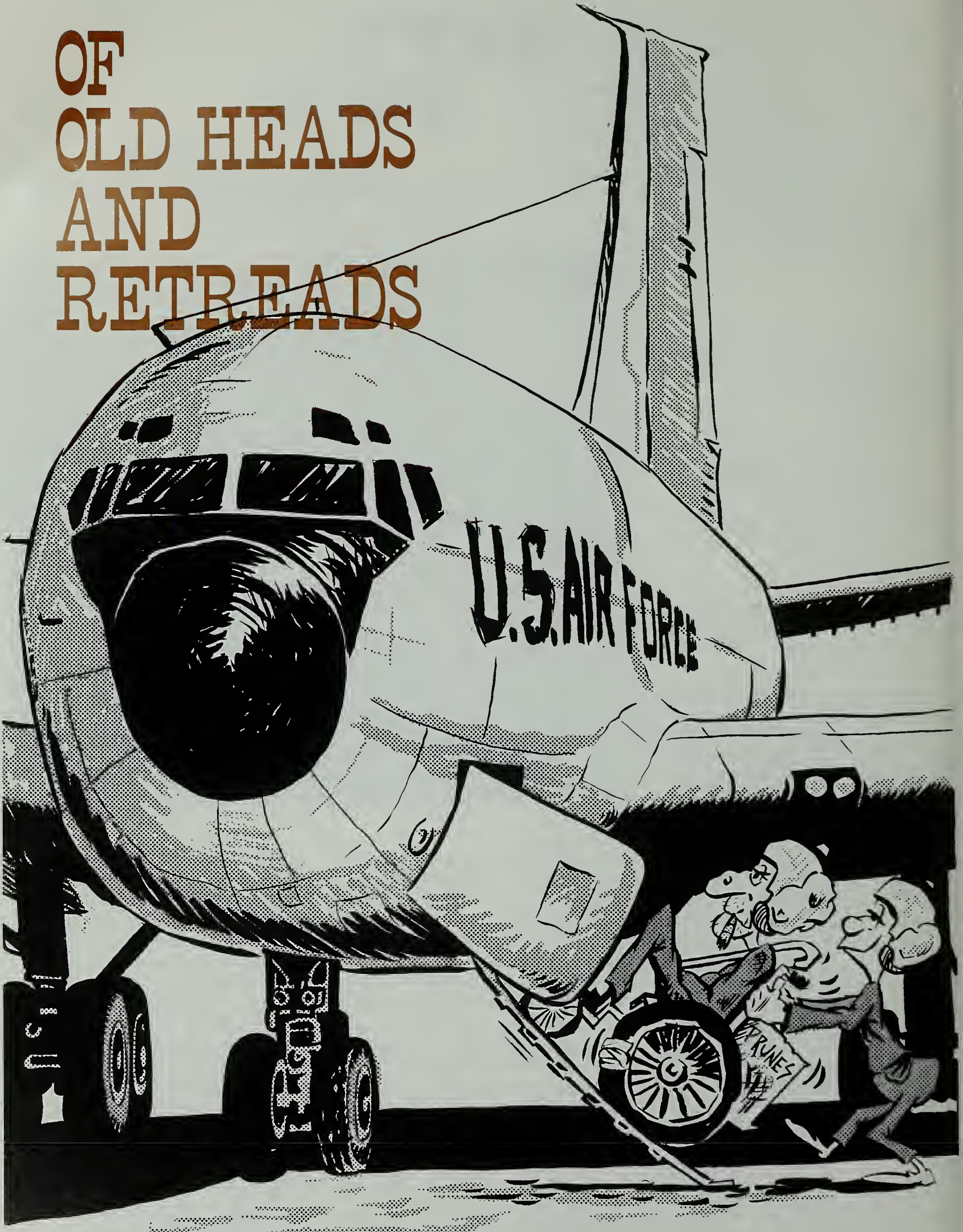
What obstructions are on the route? When flying briefed altitudes, you will avoid these obstructions. However, degraded equipment may force you to fly visual terrain clearance and may put you quite legally below desired altitudes. For instance, if the terrain trace and radar altimeter are both unreliable, you are forced to interpret terrain clearance based on the EVS picture and the copilot's cautions. Even experienced pilots have trouble determining altitude visually. Towers and other hazards should be noted during mission planning and looked for during flight.

Study the contours of the route. By adding the clearance plane to the contours, you will have "target altitudes" for the climbs and descents you encounter, or when terrain trace information becomes unreliable. Close contour lines reveal the need for steeper climbs and descents. They may also make six or ten mile range gates more desirable. Contour study may reveal a ridge that masks one behind it. The second ridge may not be noted on the terrain trace if it is passed during the trace dropout phase of the first ridge crossing. You may find lava beds or other craggy areas where flying a constant altitude may be the best course of action while the radar altitude is spurious.

One last point, trees, telephone poles, etc., will not be charted and may reduce your expected obstruction-free clearance. At low altitudes the wing drop in turns, radar altimeter error associated with bank angle and rough terrain are conditions which must be anticipated. Adjust your altitude where necessary to provide safe clearance.

The next tip will be on determining aircraft performance.

OF OLD HEADS AND RETREADS



Capt Howard Harding
410 BMW, K I Sawyer AFB

My dear old dad used to say never trust a retread over 60! You show me a flyer returning to the cockpit over 60 and I'll show you a man with a real gate problem. I'll also show you a man who doesn't have to move very quickly. Because he can't? No, because there are no new ways to get behind the power curve. There are even fewer ways to recover; this guy has been there and seen it all and he will not risk being caught speeding. In this article I will suggest some obvious ways to learn from the experience of others and some apparently little-used ways to preserve that knowledge.

By retreads, I am referring to the flyers returning to the cockpit after numerous years doing something else somewhere else. These individuals can be recognized by the brand new soles and heels on their boots and an alarming ability to imitate Alice's Cheshire Cat on the alert force. I am assured this disappearing problem is being solved; other problems faced by crewmembers have either been solved or abandoned by these same flyers. All the warnings/cautions/notes in our various Dash-One's are the results of someone else's experience — these guys. Instead of creating our own dangerous experience, we ought to mind the experience of these retreads. And then the information should be written down.

The systems we work with now — and here I am addressing mostly the navigator teams — tend to be composites. For instance, I was once told that the BRIC came straight out of the B-29. Quite by chance, some of these retreads worked with these systems when they were brand new and state of the art. In this wing alone, we have some D-model troops, some from the B-47's and probably the B-58's, and there's even a guy with 400 hours in the B-36. About three missions, to hear him tell it. The equipment from these airplanes hasn't invented any new ways to break either. Now, while we've got them on alert, is the time to sit down and talk with these returning flyers. What system checks were performed inflight in the past to prove or disprove system alignments, operations capability, etc? How did they pass the time on the ground during a weather or maintenance delay? What checks used to be SOP when missions were longer and less compressed?

At the same time that we are using these older systems, the maintenance troops for these systems are getting younger. The more specific we can become in analysis of problems the better the maintenance we can expect. In the maintenance debriefs I have attended, the problem sometimes turns out to be an inability on my part to communicate the symptoms or an inability on his part to ask the right questions. This can show up especially on interlocked systems. Is a bad wind problem in the Doppler system or in the BNS? Is a problem with the bomb doors not closing to be solved in the BNS system or in hydraulics?

During alert, why not sit down and talk with these retreads and then put the information into checklist format for the entire squadron? We have moved into the area of creating plastic brains. I carry my special-purpose information in an informal checklist binder — I'm sure we all carry something very similar with diversion flight plans, fuel loads, bombing tables, etc. These equipment checkout procedures could go into the same binder. Comes time for maintenance debriefing, out comes the binder with analysis information written down in grease pencil. This should speed up the debriefing, educate the debriefers as well as the operators, and improve maintenance on the fleet. All three of these improvements will add up to increased safety for us all.

These locally created plastic brain inputs would be a logical piece of baggage for the guys going to Castle AFB for upgrade at CFIC. Good information can be passed from wing to wing this way. I'm sure it is already done informally, but does anyone have a formal program of collecting the procedures at Base X from the plastic brains of people transferring into the squadron? If you've got something really clever and you really believe in it, you could try showing it to CEVG. Who knows — maybe this could be something else to talk about after the flight.

Not all the retread information will be in the area of maintenance. A large box of salt would

be a good idea, of course; but how were ORI's run in the past? SAC has deserved its initials for years (simulate, authenticate, etc); have we invented any new wheels, recently? As an example: there used to be a system where wings received incentive points based upon training accomplished. Were any of these retreads in the force when a wing got caught sending a tanker through a low level scoring site? They would have gotten away with it, too, except someone was on an errand outside the site and noticed the boom coming out of the tail. Makes you wonder what kind of modifications they had, though. Some sort of scoring tone, of course; a map-match line on the radar scope, perhaps. Sound like the basic ORI press-on scenario?

These retreads should know a bit about double standards, as well. By this I mean different sets of criteria for flight operations depending on who is aboard. I have heard a rumor of alarm over at Stan-Eval: busts on scheduled checkrides are running at one-half the rate on no-notice checkrides. This doesn't sound too bad until you turn it around. Twice as many are busting the no-notice checks. This suggests looser parameters on normal missions — and where there is slack, there is danger.

One of the reasons these retreads are around: they survived. Their flight time will total into the thousands; think of the navigation legs they have slept through, the touch-and-go's they have endured, the bunk-time they've logged, and the blasted bus time logged. And if we have developed bad habits in mission planning or sloppy habits in flight, think how quickly they should spot it. It was Ovid who said, "Nothing is stronger than habit." He could have mentioned that the only thing harder than breaking a bad habit is establishing a good one.

Every pilot I've flown with has coordinated the ground alert drills within the crew — who does what when the horn goes off. Why limit this to ground exercises? A decision arrived at in committee on the ground is probably better than six different solutions arrived at during a crises in the air. I wonder how many of us actually coordinate the route to fly if we have to bust out of low-level for weather every mission. How many of us monitor the airspeed and altitude consistently — during every approach? How many of us can say we have never been busted for oxygen or safety of flight procedures — and neither has the guy sitting next to us?

In the matter of breaking bad habits and establishing good ones, we have some marvelous motivating words to live by: "Aviation, like the sea, is inherently dangerous and unforgiving of any carelessness or neglect." You don't agree? Like Stan-Eval, death does not have a double standard. Nor does he play favorites.

Old systems, old problems, old solutions, old heads and retreads. I suggest we sit down and communicate: how to survive, how to succeed, how to coordinate, and how does that Cheshire Cat smile work again?

SAC PILOT RECEIVES 1979 KOLLIGIAN TROPHY

A successful emergency landing has earned an SR-71 strategic reconnaissance aircraft pilot the 1979 Koren Kolligian Jr. Trophy.

The award was presented to Maj David M. Peters by Air Force Chief of Staff Gen. Lew Allen Jr. in a Pentagon ceremony, recently.

On April 28, 1979, during descent from an operational mission, Peters shut down the right engine of his aircraft because of an engine system malfunction. After requesting an emergency recovery and upon reaching traffic pattern altitude, Peters noted the oil pressure on the remaining engine began to fluctuate and the engine appeared to be losing oil.

Faced with the impending loss of this engine, Peters restarted the right engine, even though its erratic performance provided little additional thrust.

Shortly thereafter, while preparing for an expedited emergency landing, he had to shut down the left engine due to a complete loss of oil pressure – leaving him with only the poorly functioning right engine. Despite these problems, he decided to stay with his aircraft and succeeded in landing it safely.

Peters, who is assigned to the 9th SRW, Beale AFB, thanked the Kolligian family for the award and acknowledged his reconnaissance systems operator, Maj Edgar J. Bethart, Jr., "who, without his trust and understanding as a crew, I wouldn't have been able to stay with the airplane and successfully land it."

The award is named in honor of 1st Lt. Koren Kolligian Jr., declared missing on a flight off the California coast in September 1953. Established in 1957 by the Kolligian family, the award is presented annually to the Air Force aircrew member who most successfully copes with an extraordinary in-flight emergency.

VDP

do you think before you act?

Capt William T. Tuttle
4017 CCTS

Two schools of thought prevail concerning the nonprecision final approach rate of descent from FAF to MDA. One technique requires a rate of descent which guarantees the longest possible level flight time at MDA. The objective of the second technique is to arrive at the MDA prior to the VDP, but does not require excessive flight time at the MDA.

Let's look at the first technique. It's advantage lies in the "no thinking or planning" required approach. The only pilot skills involved are to lower the nose, pull back the throttles and let 'er rip, 1100-1500 fpm and in no time, here comes the MDA. The VDP, defined in TERPS as "a point on the final approach course of a nonprecision straight-in approach procedure from which normal descent from the MDA to the runway touchdown point occurs," is still miles ahead. More moderate advocates of the "Get Down" approach claim two to three miles is optimum for level flight. Visually acquiring the runway or its environment is of paramount importance to assure landing from this nonprecision approach.

But how long does it take to find the runway from the nonprecision final approach course? Obviously, weather is a major determining factor. In VMC, the one to one and one-half minutes spent at MDA should be more than adequate. "One to one and one-half minutes?" you say. Yep, based on ground speeds of 120 KIAS to 180 IAS, a reasonable assumption. All but the last 10 to 15 seconds, VASI's show red over red. (TERPS states that descent below MDA is not authorized until reaching the VDP and with runway environment in view.) With VMC conditions, acquiring the runway poses little problem, but don't those obstacles look close? TERPS criteria is based upon a descent gradient of 400 feet per nautical mile. Multiply this value by your ground speed in nautical miles per minute and your maximum safe rate of descent in feet per minute is the result. For example, 150 KIAS or two and one-half nautical miles per minute x 400 gives a 1000 FPM rate of descent. As you can see, excessive rates of descent can pose a real problem, especially at slower ground speeds, such as with strong headwinds. Navigators can be invaluable with their altitude calls and by providing drift and ground speed information. (See the BIG I articles on wind shear, March and June issues of Combat Crew.)

You say getting down to MDA in IMC is where it's really critical. Those low ceilings will hide the runway. A true statement, especially if the ceiling happens to be just above your MDA. The hazard here is insidious. Once you see the runway, you may fixate on the ground or visual references and not give your instruments their due cross-check. The tendency to "duck under" obscuring clouds or a sloping cloud deck is also increased. The proper time to descend from the MDA is at the point from which a normal landing can be made, the proverbial VDP, and not before (see AFM 51-37 and TERPS, para 251).

So much for the one advantage and several disadvantages of the "get it down" technique. What can be said about the school of thought that emphasizes VDP in determining descent rate. First of all, planning the approach is not as "easy" as in the previous example. Every approach is considered unique and should be evaluated based upon its characteristics. Some approaches require nearly the maximum allowable gradient of 400 feet per nautical mile to descend from the FAF altitude to the MDA. For others, the FAF altitude may already be below the "normal" glide slope for the runway and require a very shallow gradient. (Compare Castle AFB RW30 TACAN FAF altitude to the ILS glide slope.) Still others may have intermediate step down altitudes requiring two different rates of descent. In all cases, however, the approach must be reviewed before being flown, preferably during mission planning. Incorporate into your review, the determination of approximate descent gradients, e.g., 2°, 3°, 4°, for 200, 300 or 400 fpm required. Plan to arrive at the MDA approximately 15-30 seconds (one-half to one nautical mile) prior to the VDP. While flying the approach, continue to compare the established rate of descent to that planned. A slightly higher than planned rate of descent initially, followed by a gradual reduction approaching MDA, makes for a smooth and *precise* nonprecision approach.

Anticipate visual cues as you approach the VDP. "Planned" arrival at the MDA, especially in IMC, minimizes the possibility of the over-anxious pilot from ducking under. VDP awareness can prevent optical illusions from becoming hazardous while acquiring the runway environment. Make maximum use of the other pilot and any observer. Eliminating the long, drug-in final insures the pilot will actually see more useful visual cues and not as many illusions.

Two more quick observations on using VDP's. First, don't calculate them to the gnat's eyebrow. Equipment tolerances, meterological conditions, and pilot reaction and senses don't require anything closer than one-half mile (10-15 seconds). That one-half nautical mile is even within TERPS design standards. Secondly, although DME is really convenient, don't fall into the habit of using DME exclusively. VOR and ASR approaches without DME are common.

To plan a VDP for the VOR approach, determine your timing to the MAP (normally over the end of the runway). Using the HAT and a desired rate of descent on your visual final (500-600 fpm works very easily) determine the time required to touchdown from MDA, assuming constant ground speed for simplicity.

Example: If the time from the IAP chart FAF to MAP is 2:35 and HAT is 400, then let's call the desired rate of descent from MDA to touchdown, 500 fpm. Time from MDA to touchdown,

$$\frac{400'}{500 \text{ fpm}} = 48 \text{ sec.}$$

Time to planned VDP, 2:35 – :48 = 1:47 seconds

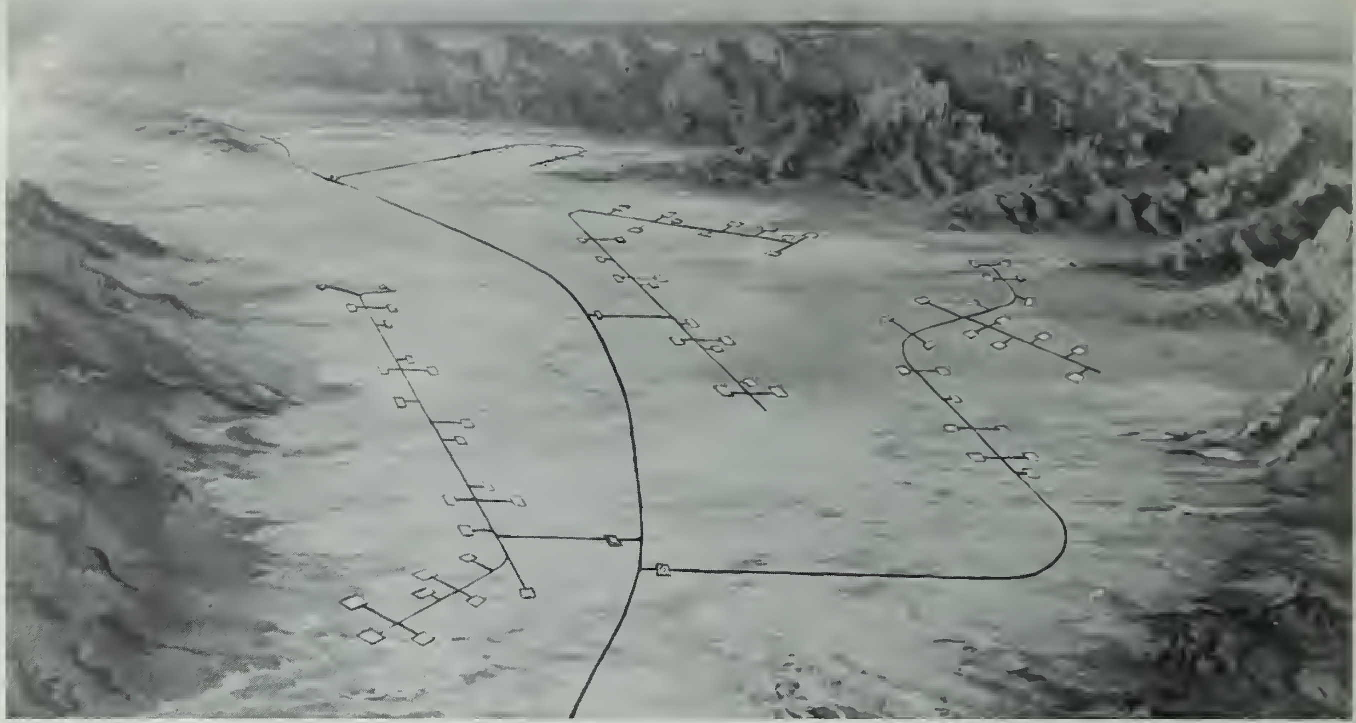
If we allow for level flight at MDA of 15-30 seconds before the VDP, the time to descend is 1:48 – :30 = 1:18 (1.3 min). The planned rate of descent is determined by dividing the altitude to lose between FAF and MDA by 1.3. The approach then would start out at the planned rate of descent departing the FAF which would be held just over one minute, then gradually decreased the next 15-20 seconds to level at MDA for 15-30 seconds. At the VDP, make a normal final approach to touchdown.

Calculating a VDP for a non-DME ASR is even easier. First, divide your HAT at MDA by your desired gradient on final glide slope and determine distance from runway (ASR using ASR scope) or from touchdown (ASR using PAR azimuth). These two points may be considered approximately the same for computation. Desired glide path 3° = 300 feet/NM. If your HAT were 363, you would start down 1.2 NM from touchdown. How do we use the 1.2 NM? Easy. It's between the radar final controller's two-miles from touchdown call and the one-mile call; therefore, attempt to level at the MDA just after the controller's two-mile call, comparing recommended altitudes on final to actual aircraft altitude. One hundred feet below recommended is usually sufficient until approaching MDA and leveling.

Of course, if a published DME is available, by all means use it. Just be aware that there are other means of determining a useful VDP. Knowing where you are at all times on final will help you make safe decisions in departing the MDA. In any case, you should find that the smaller power changes required in flying the VDP-planned approach make for a smooth, controlled final approach.

After all this propaganda, if you still are a "get down" type, I only hope you are well-insured. Watch out for the "Eat at Joe's" sequenced flasher one and one-half miles out on final. The diners may not appreciate your unannounced presence as you drop in.

DEPLOYMENT



The first of this two-part article was in our August issue and covered the need for the MX. This second article addresses the unique deployment concept.

M-X Part II

the ICBM legacy continues

Maj David K. Snider

The base line horizontal shelter concept calls for 4,600 shelters grouped into individual clusters of 23 shelters interconnected with a road. One missile carried on a launcher with support equipment will be located within each of the 200 clusters. Knowledge of which of the 23 shelters the missile is in will be denied to any potential attacker. He will know that only one shelter contains a missile, but he will not know which one it is. When the missile launcher is removed from or emplaced in a shelter for maintenance or other reasons, it will be carried by a manned transporter which hides the missile and aids in preserving location uncertainty. The transporter will visit each shelter and perform the same procedures, removing or replacing the missile launcher at one. Signatures emitted by the missile launcher while in the shelter or transporter will be simulated or masked. Security measures will not allow access to the shelters themselves thus reducing the effectiveness of external observation. Internal knowledge of missile location will be kept to an absolute minimum. The number of people (maintenance teams, staff personnel, etc.) having knowledge of the location of one or more missiles will be extremely low.

If missile location uncertainty is compromised, or we have reason to believe the Soviets have "broken the code," the missiles can be put into a continuous movement mode or moved to another shelter. The flexibility built into the system provides an "escape valve" for virtually any contingency.

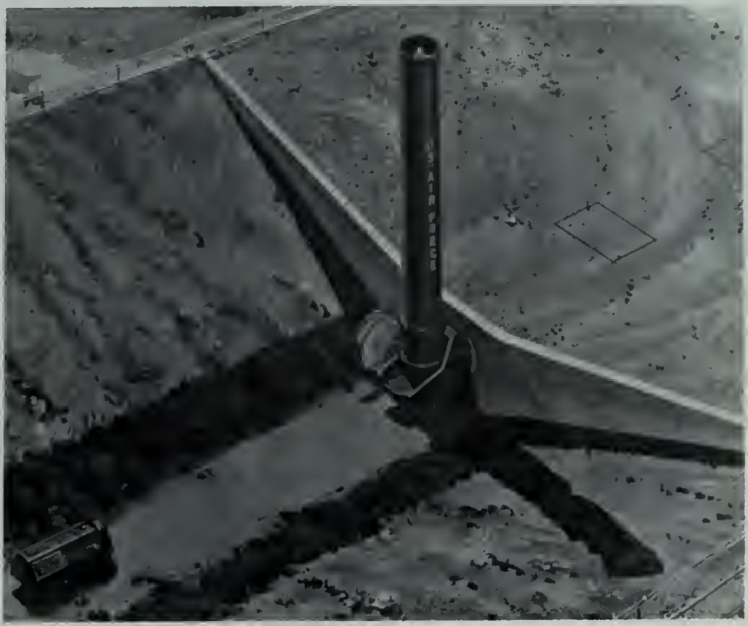
As a result of the procedures and system characteristics described above, we are confident that an attacker would have to target all shelters in order to have any assurance of destroying the M-X force. It is, in a word, survivable.

But where do we put a system of such magnitude which meets the criteria for land usage, minimal environmental impact, and public understanding and acceptance?

Although several potential Western-Southwestern deployment areas have been examined, the leading candidates for M-X basing are in Utah/Nevada and Texas/New Mexico. The Utah/Nevada area is basically a desert plateau region interspersed with mountains and valleys, it is, in rough outline, bounded on the west by Tonopah, NV, on the north by Ely, NV, on the east by Delta, UT, and on the south by Las Vegas, NV, while the Texas/New Mexico area surrounds Cannon AFB near Clovis, NM. Only a relatively small portion of this land would actually be used for weapon system deployment. Normal public access to the area would be permitted except for each fenced 2.5 acre shelter site and other Air Force Facilities. Comprehensive environmental impact studies for both areas are in progress.

Prototype M-X transporter built for M-X vertical shelter basing mode. Transporter for current horizontal shelter basing mode is similar in size.

View of M-X launcher following exit from horizontal shelter and erection for launch.



Simultaneous with Air Force efforts to narrow the deployment area selection process, SAC is planning its organization to manage and operate M-X. Although final resolution remains the subject of serious debate and study, SAC has proposed a two-base, two-unit organization with Area Support Centers (for forward area personnel support and dispatch), maintenance facilities, and security facilities strategically placed throughout the missile field. The two M-X missile units will be structured to accommodate command control, operation, maintenance, security, and support of the weapon system.

Centralized command control and peacetime operation of the M-X system will be conducted from an Operational Control Center (OCC) at each base. The primary management functions for operations, maintenance, security, transportation, communications, etc., will be here. The familiar Command Control Division, Maintenance, Security, Communications, and Transportation Controls will still be around, but in a much more automated and centralized fashion.

A dedicated Airborne Launch Control System, with aircraft both on continuous airborne and ground alert, will provide a survivable backup with an immediate capability to command M-X if the OCCs are lost or otherwise incapacitated. The M-X ALCC will perform airborne alert in a corridor surrounding the missile field

Artist's view of a horizontal shelter site as seen from the adjacent public road.

but will not overfly it. The ALCC will be "held off" when the OCC(s) are in line but will be provided encrypted current status.

Missile Launch Crews will perform duties in the Launch Control Center (LCC) portion of the OCCs and in the ALCCs. M-X crews will have the first line EWO preparation and execution duties as well as general responsibility for the M-X force. Their status monitoring, reporting, and team processing functions will be considerably less, however, due to system automation and the necessity to preserve missile location uncertainy. The crew in a single LCC will be able to launch any or all missiles. Although the two units will likely assume equal field responsibility, the total complex of 4600 shelters will be interconnected with each unit capable of assuming command control of the entire force.

M-X maintenance will be basically an organizational level remove and replace operation in the field with intermediate and perhaps forward area depot functions performed at the bases. Maintenance activities, however, will be supported and managed by a highly accurate and specially designed computerized fault detection/isolation and management system. The Maintenance Control functions in the OCCs will exercise primary monitoring and overall control responsibilities with mini-maintenance controls serving each of the several Area Support Centers. Teams will dispatch from these Area Support Centers and from the bases to perform maintenance in the shelters, at a maintenance facility to be located within each cluster, or to return the missile to the base. Communications maintenance personnel will operate in essentially the same manner as missile maintenance teams and will frequently be part of a composite team due to the design of the weapon system. Strategic Arms Limitation monitoring requirements, roads, and power system maintenance will also necessitate considerable Civil Engineering activity in the missile field. All such activities in the deployment area will be strongly influenced by the necessity to preserve missile location uncertainty. A highly stringent, compartmentalized control of all information pertaining to these activities will be necessary at the OCCs and Area Support Centers. The number of people with knowledge of missile locations will be kept to an absolute minimum.

M-X security will include a point sensor system for each shelter site and a radar network capability for wide area surveillance. These elements will accommodate public access to the area, except for the fenced shelter sites and Air Force support facilities, without compromising weapon system security or unduly taxing the response force. Overall unit security status will be monitored by the Security Centers at the OCCs. Primary alarm termination and response force dispatch points will be at security facilities located in the deployment area.

While system engineers are concentrating on the complexities of weapon system design, the man-machine interface has not been forgotten. Human factors are

Continued on Page 30

SAC STRATEGIC PROJECTION FORCE

Capt Terry L. Tooley, Offensive Avionics Acquisition Manager, HQ SAC/XPHN

This month the R&D corner takes a look at the aircraft modifications proposed to support the SAC Strategic Projection Force (SPF, pronounced spiff). However, before we do, some background information is necessary on why the SPF was formed and what it is.

Recent world events highlighted a critical need for a U.S. rapid response capability to rapidly project a conventional weapons force in response to any time-sensitive crisis. As a result, National Command Authorities directed a U.S. military capability be developed and trained for quick reaction deployment and employment to give the U.S. a worldwide military option in a crisis situation. From this guidance, the Joint Chiefs of Staff (JCS) formed the Rapid Deployment Joint Task Force (RDJTF). To provide combat support to worldwide contingencies and the RDJTF, CINCSAC directed the development of the SPF. The B-52H was selected to support the SPF because of its greater unrefueled range than the B-52D and more sophisticated penetration capabilities. There are three specific advantages which derive from the employment of the "H". First, the bombers can operate from "sanctuaries" outside the hostile fighter threat area. Second, because the aircraft are bedded down outside the immediate battle area, they are not competing for airfield and basing facilities with other U.S. or allied forces. Third, they can be employed by the supported commander without competing for KC-135 air refueling resources.

In addition to the bomber force, the SPF includes a full command, control, communications and intelligence network. Real-time data from such sources as the SR-71, U-2, RC-135, E-3A, and satellites will be collected by a forward area fusion center. There, the data will be analyzed and provided as intelligence to the battlefield commander. Rapid response of the SPF assumes the prepositioning of POL and munitions at forward bases. The requirement for forward basing locations has been formulated and presented to appropriate agencies for action and funding.

To use the B-52H in the most efficient manner, SAC has proposed avionics and structural modifications. The avionics modification will integrate attitude, heading, and velocity data from the SRAM Inertial Measurement Unit (IMU) into the ASQ-38 bomb nav system. The SRAM system will also be modified to allow for ground alignment. As a further aid to the crew during the target acquisition phase of weapon delivery, the EVS sensors will be allowed to track the target direct, independent of the position of the radar crosshairs. Finally, a laser will be integrated into an EVS sensor, virtually eliminating ranging error.

The structural modification consists of the "Big Belly" modification performed on the B-52D and the addition of an external stores capability. The Big Belly modification increases the internal carriage of MK-82 500 lb bombs from 27 to 84. The external modification uses the AGM-28 pylons, multiple ejector rack (MER) beams, and MERs. The addition of external stores brings the total capability of the B-52H to 108 MK-82s.

These proposed modifications give the B-52H the ability to deliver weapons with extreme precision. The increased accuracy substantially reduces the number of sorties required to damage or destroy all types of targets. This decrease in weapon delivery error coupled with the significant increase in carriage capability of conventional weapons provides an autonomous force capable of accurately delivering massive firepower anywhere in the world.

Although neither the avionics or structural programs are funded yet, they are moving through the funding wickets in Washington and the outlook looks good for quick approval. With this effort SAC may indeed have a highly accurate, quick response conventional capability as a complement to our quick reaction nuclear capability.

JUST ANOTHER ORI

1Lt Max D'LaRotta
77th BMS, Ellsworth AFB

It all began like any other operational readiness inspection day. Our crew was preparing to fly a training sortie, when the Inspector General team landed. The day progressed with the usual ORI routine. Aircraft were generated and crew testing was completed, some crews were released while others stayed on alert.

Just hours after being released from generated alert, our crew was put on telephone alert. As time passed, all sorts of wild rumors spread among the crews. These ranged from new hours to fly the ORI route to some sort of secretive Middle East mission. At 0930, Sunday, 9 December 1979, I got a phone call. Pack enough clothes for about two weeks, and be in the briefing room at 1230. Destination: Guam.

That's right, Guam, that magical island well known by the SAC crews of ARC Light and Bullet Shot days. At the appointed time our crew joined the others for briefings, out processing, and common bewilderment. So began the initial deployment of the "Last to Know, First to Go" Detachment One from Ellsworth.

History was being made about the B-52H. We did not know what our role would be, but as combat crewmembers we were ready for the adventure. As the gear of our aircraft lifted off terra firma, we could sense the excitement all around. We were really going to Guam. We B-52 crewmembers, who longed for TDY, were now getting our chance. The flight progressed smoothly, and soon we were leaving the Pacific Coast of the "States" behind, settling in for the work ahead. For some of the old heads, long range overwater celestial navigation wasn't new; but for the rest of us, it was really an experience. The nav teams worked hour after hour taking fixes and updating ETAs to all reporting points. The pilots took turns at the controls maintaining our cell position, while the defense tuned their equipment, monitored the cell and kept the oven warm. Before we realized what we had accomplished, the nav team announced that Guam was on the scope, after 15 hours straight from Ellsworth, without refueling. The pilots obtained clearance to land and we touched down to temperatures and humidity "slightly" higher than we have grown used to on the great plains of South Dakota.

After our initial welcome by customs, and a brief encounter with immunization, we were greeted by the staffs of 3d Air Division, the 43d Strategic Wing and the 60th Bomb Squadron. The next day, we began to get an inkling of what this deployment was all about. No, we were not sent there to go on alert, as some of us had suspected. Our role was going

to be something different from the nuclear arena. We were briefed on the conventional role for which we would now be training. Literally within hours after our wing staff had been notified of our impending deployment, we were flying, studying and developing new tactics for the B-52H in sea surveillance, cell formation, mine laying and other conventional ordnance delivery. With the support of the 43d Strategic Wing, the 60th Bomb Squadron and their training flight, our crews quickly adapted to the new role. Our detachment staff, the crews and those "Sierra Hotel" maintenance troops demonstrated a dedication and professionalism that gave the impetus to get the job done. While 14 of our crews trained in Guam, our buddies back at Ellsworth launched 14 B-52s and three KC-135s in subzero temperatures on the ORI mission we had been programmed for all along and passed with flying colors. In fact, even with all the turbulence associated with working both missions 5,000 miles apart, the 28th Bomb Wing achieved an "Outstanding" rating. After 10 days, the bulk of the detachment redeployed home while four of our crews stayed for further training.

While on Guam, our crews not only worked hard, but really enjoyed themselves. We did a lot of touring around the island. Our travel was made appreciably easier with the use of borrowed "Guam Bombs." Imagine a whole B-52 crew fitting into some small Japanese-made car that only seats two comfortably. Well, we finally got it down to a science — after 30 days of practice. Seriously, the island had a lot of things to offer. These ranged from some outstanding restaurants to fantastic snorkeling and scuba diving spots. Just between us, I promised the Andersen crews that we wouldn't sell the island to you as a future assignment.

The deployment proved a lot of things about the B-52H. With its longer range, it proved to be a more feasible aircraft for the sea surveillance role than the D or G models. We found that it could also do the job in conventional ordnance delivery. We performed several releases with systems never really tested before on the H model. The D model tactics were feasible, with minor adjustments for our equipment. Most importantly, it showed that our crews could respond rapidly and effectively to troubled parts of the world. At a time like this, that is reassuring. The deployment ran smoothly, thanks to our wing staff, the mobility teams and all the support agencies, but most of all the aircrews who performed at their best. Now, as we prepare for our next ORI, we wonder where we'll be flying it this time! England would be nice.

Don't Get Goosed by a Giggling Gaggle of Geese

Capt Ross W Phillippe
Editor

Little has changed since Lt Col White authored an article with the same title for *Combat Crew* in March 1971. Air Force aircraft continue to strike birds by the thousands which result in millions of dollars worth of damage yearly. AFISC recently completed a bird strike reporting program and results of this two-year study should be in the September issue of *Aerospace Safety*. The big question, "How can we appreciably reduce our losses?" remains elusive. However, if there is an answer it probably will center on crew actions in the event of a strike, knowledge of bird activity, communications, and base support of AFR 127-15 for reducing local bird hazards.

As you know, there are two types of strikes which pose the greatest danger to the crew. One is engine ingestion during a critical phase of flight and the other is cockpit penetration. Engine ingestion can occur at any airspeed whereas cockpit penetration depends upon a combination of airspeed and bird weight. If the crew is prepared, an engine ingested bird should not pose a problem which cannot be handled. Engine power loss generally is not immediate and in many cases is mistaken for a mild compressor stall. Continued operation of the engine, however, can result in much greater damage and increase your hazard potential. But, if you fly through a flock of birds and more than one engine is damaged, you could find yourself in more trouble than you bargained for.

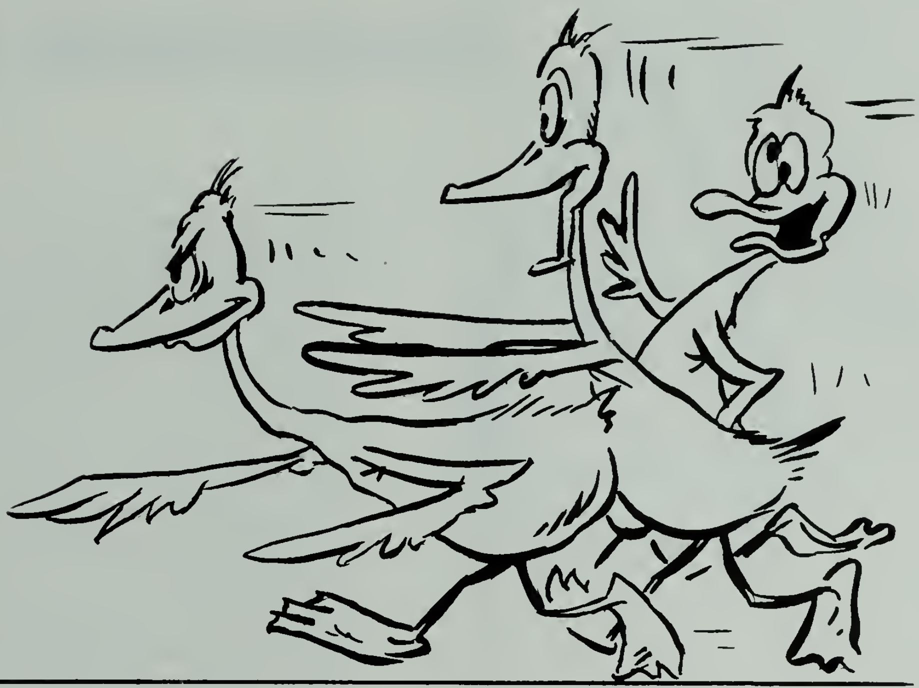
By far, the most serious strike that can occur is one which results in cockpit penetration. Generally, pattern airspeeds for B-52 and KC-135 aircraft are insufficient to develop the bird impact forces necessary for cockpit penetration. The FB-111 is more vulnerable because of its higher pattern airspeed. There may be exceptions but records indicate no cockpit penetration in the traffic pattern have occurred to date including FB-111's.

Bird strikes which occur during high speed-low level operations are of primary concern. The B-52/FB-111A are currently flying low level routes at airspeeds capable of producing bird contact forces which *can* cause cockpit penetration. There have been two B-52 mishaps in the past two years where this has occurred. This hazard potential increases as the migratory season begins. There are three things a crew should do which may prevent a catastrophic occurrence should a strike occur:

- Be mentally prepared.
- Keep the visors down.
- Turn on windshield heat to increase windshield resilience.

Earlier we cited communications as one of the possible answers for reducing our losses. Before we go further, there are several observations to make, all of which are currently valid.

- We will continue to train low level.
- We will continue to fly training at our present airspeeds.



- Birds will continue to migrate.
- We will continue to have local bird problems at some of our bases.
- We will continue to have bird strikes.

The number of strikes which occur can be reduced by communicative effort. If we know where the birds are, then we can be better prepared to take action to avoid them.

The aircrew is a vital link in obtaining current information on enroute bird activity and SACR 50-4, Vol 1, sets the procedures for the relay of hazardous flight conditions. When a gathering/migration of birds is observed or bird strikes occur while enroute, the information must be transmitted as soon as possible. The most expeditious manner is to relay the information to the STR site. They are required by SACR 50-4, Vol 1, to, in turn, relay the information to other aircraft on range, to the NAF controlling the route and to the FAA center. The relay from the crew should be accomplished when workload permits but it is essential it be accomplished.

The new high-low altitude weather report instructions (AFR 55-8, Vol IV, SAC forms 1417 and 1417a) have been expanded to include specific bird information. The revised regulation will become effective in October 1980. When information is received by the NAF, the senior controller will weigh the severity of the bird conditions and use options available to him, including use of the alternate entry or closure of the route. Regardless of the decision made, the NAF command post will relay the information received to HQ SAC, the other NAF, all SAC units, the Fish and Wildlife Service and the scheduling activity.

This procedure should set up a framework by which real time information is available to schedulers and users. If we are to prevent bird strikes we must all work together. Do not disregard the information that is available to you and pass along any significant information you might have. It can provide the warning which will save a crew and/or aircraft.

Finally, remember most bird strikes occur below 3000′ AGL and a large majority of these are during day VFR. Expect the bird to dive when threatened and if he is above you, it may appear you are under attack. You should receive known information regarding extensive bird activity on low level routes or in the traffic pattern. If you opt for a higher altitude, make your decision as soon as possible. The higher you go, the less chance you have for a strike. Statistically, nearly one-quarter of all strikes occur between 0-100 feet AGL or just prior to touchdown. Also, if a suspected strike is disregarded you could incur additional damage if birds are ingested into the engine and normal operation is continued.

It is unlikely we will ever totally prevent bird strikes, but exposure and damage can be reduced through our combined efforts. Don't get into the habit of disregarding our feathered friends and have a safe flight.

CFIC Corner

PREPARING for the T-4

Major Kurt A. Wetzel
CFIC B-52 Brn IEW
Castle AFB, CA

Captain Thomas W. Brown
IEW, 68 BMW
Seymour Johnson AFB, NC

On 18 December 1972 I was the EW on Smoke Three, B-52D, about 50NM west of Hanoi heading east. I remember looking at my warning receiver and thinking, "Wow, it looks like a run away T-4. I've been here before." The key was the confidence I felt that I had succesfully handled this situation before. In a sense I had, in the T-4 trainers during my training at the B-52D Replacement Training Unit (RTU). The instruction at RTU was superb. It was highly motivational, positive, and well prepared. The T-4 mission provided realistic scenarios that gave the student confidence in his ability and the aircrafts capability. Procedures that would lead to success were stressed.

How are your T-4 trainers going? Do you take them all seriously? Do you prepare prior to the trainer? Does the B-52 ever survive the mission? Answer "no" to any of these questions? Perhaps its time for you to review how you prepare for instructing a T-4 mission.

In order to achieve optimum training during a scheduled T-4 mission the instructor must be fully prepared. Each trainer period must be treated individually and prepared for separately. An hour's worth of preparation will maximize the two hours of training in the T-4. SACM 51-52, Vol III requires the student to study the composite sortie package, EWO and tactical doctrine sufficiently to have thorough knowledge of the Radar Order of Battle and crew action. As the instructor, you must do the same — plus. Instructor preparation can be divided into three phases: Subject preparation, mental preparation, and physical preparation.

Subject preparation includes those items that an instructor should do to enable him to teach. First off, the "what", "when" and "who" comes from the ground training schedule. Don't develop the habit of just betting the when, and letting the who and what be a surprise. It could be an unpleasant one. Make a note of who you are to instruct and what particular type of mission is scheduled. Follow it up. Insure that the scheduled mission fits the students needs and requirements. With the number of requalifications on the increase, the student may require some what less than the common trainer missions. When was the last time you've instructed and S41E or S69E? You do know where to look to translate these codes? If you doubt the correctness of the mission scheduled, check with the T-4 supervisor or the Defensive Systems officer. If you're satisfied, the next step is to insure you have the knowledge to teach. You were assigned the trainer by virtue of being an instructor. However, you may be instructing the mission for the first time. Don't be foolhardy, review the lesson plan in advance. Allow yourself adequate time to aquaint yourself with the objectives and presentation. From your previous CFIC experience you know it is impossible to read a lesson plan and simultaneously operate the trainer console. While you're in the reviewing mode, when was the last time you looked at SACR 55-21 and the other directives. If you've just come back from leave or TDY, ensure you're up on the latest changes. Avoid having the student fill you in. Rather you should fill in the student.

It is as important for you to know the student, as it is to know the lesson. Hopefully your unit has some method of recording student performances on previous missions. SAC Form 229, EW Officer Performance Worksheet, has been discontinued. This is too bad since, if used properly by the unit, it provided excellent background on your student's previous performance. If a void in this area exists at your unit, perhaps you can come up with a local system of recording trainer performance. The 2nd BMW, for example, keeps a classified notebook record of T-4 missions at the trainer. If you have further questions about the student, contact his last instructor or defensive system personnel and see what insight they can provide. Armed with information on the lesson and student, you're prepared for the final step of subject preparation, constructing a game plan.

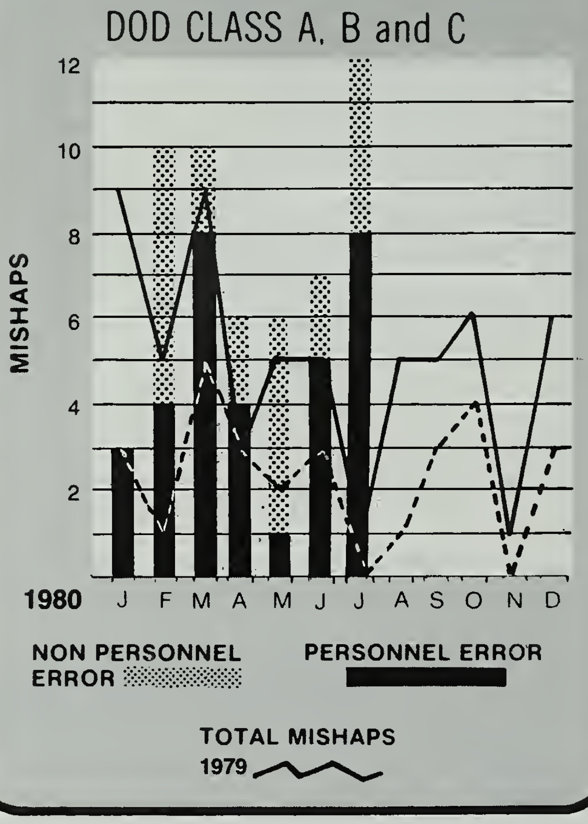
The game plan should be formulated after reviewing the student's file and familiarizing yourself with the lesson objectives. The plan should exist within the confines of the lesson plan and, insure mission objectives are met. Test the student's previous weaknesses with realistic scenarios. The key is in the quality of the mission, not necessarily the quantity. Aim for a smooth, logical mission flow. Remember the two hours include prebrief, preflight, mission and critique. Keep your game plan flexible. Be prepared to adjust to time lost due to the unexpected. Finally, some missions require an emergency procedure. Don't end every mission in a shoot-down. Remember you're programming the student for combat. End a good share of your missions with success. We all need the practice of TCM.

Mental preparation is your next step. This includes those factors which an instructor should do to be mentally prepared, "up," for a productive T-4 mission. Take a minute for careful consideration of it. Identify any problems that could detract from training. Recognize that you are the instructor, the key to a successful mission, and put those detractions aside. If the problems are so serious that you can't do this, seek a replacement. Evaluate your relationship with the student. Is your student such a good friend that a lack of professionalism may result? Is there something negative between you both that will turn the student off or, cause you to rush him through? Once again, as an instructor, you are expected to surmount these problems. Finally, evaluate the student's motivation. If you know him personally, you know his motivation. Don't allow him to distract you from being professional. Plan to control the student who will give you a hard time. For the requals coming in, realize that his last reference to a T-4 might be Ramey AFB, P.R., circa 1970. Be patient.

Ready for the final phase — physical preparation of the T-4 trainer? This is done at the time you show up for the trainer mission. It's what you always have been doing, and it's part of the two hours. Only now, you won't waste any valuable time in looking up the lesson plan, making a hasty plan, and confusing the student. You'll have prepared your game plan. You'll be up for a positive trainer mission. This will be contagious. The student's motivation and effort will reflect yours. He will perform to his best ability and recognize the full capability of his systems.

Worth the effort? You instruct only about two trainers a month. These trainers provide the EW with about ninety percent of his combat training experience. The EW has the best trainer system of any of the crew positions. If you can get it going now, when the WST arrives you can be a positive force for the entire crew to follow.

Missile Mishap Report



OOPS!

A missile handling team was performing maintenance actions that required entry into the stage II between-tanks compartment. The team obtained approval from the combat crew commander to remove their safety equipment to facilitate entry. A radio type maintenance network transceiver was placed in a drop cloth just to the right of the launch duct access door. Upon completion of the maintenance, a technician picked up the transceiver by its leather case and slightly tilted the transceiver downward. The transceiver slid from the leather case and went between the level two platforms and the launch duct wall. It struck the thrust mount on its way to the bottom of the deflector. The transceiver was destroyed. It is extremely important to insure equipment is handled and controlled in a manner which will prevent it from causing damage to itself or other equipment.

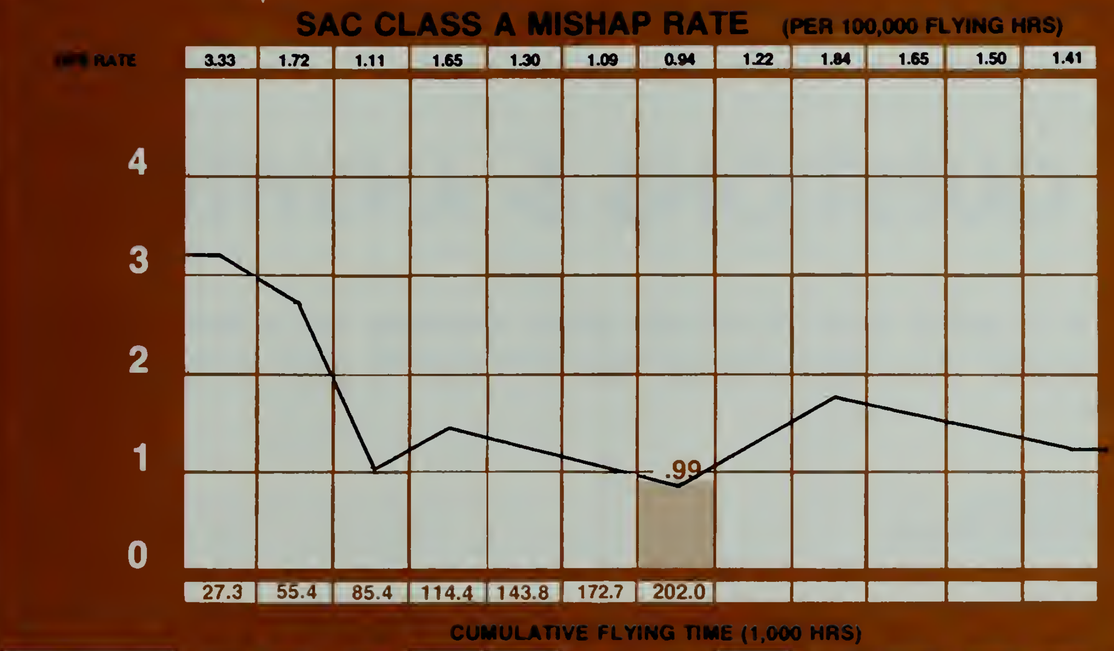
C-R-R-R UNCH!

An AGM-69A missile fin platform was damaged during a loading operation. Damage was discovered during the post download inspection at the integrated maintenance facility. Extreme caution must be exercised during the loading operation to prevent the ADU-317/E adapter from striking the missiles during loading and unloading. An AFTO Form 22 was to be submitted in April by another unit that experienced this same type of mishap. It addressed placing marks on the rails of the adapters to aid in maintaining correct tilt.

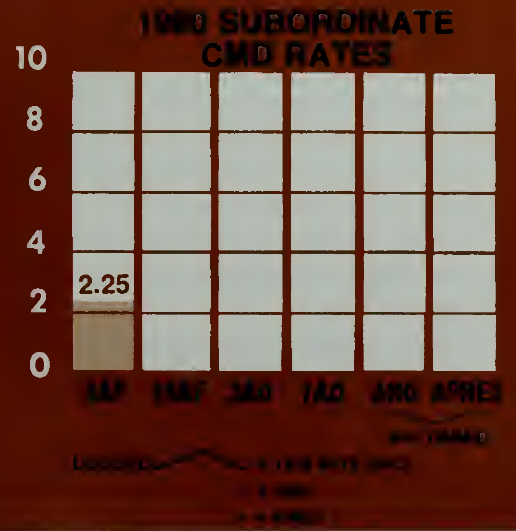
80-02-29 CLASS C MISSILE MISHAP LGM-30F

A maintenance team upon arriving at a launch facility to isolate the site from SELM configuration, found the voice reporting system address (VRSA) channel 21 (primary power failure) reporting. A site shutdown was accomplished after an unsuccessful reset. Motor generator checkout was good indicating a 403A6 drawer was issuing an invalid channel 21. No action was taken on that day to clear channel 21. Ten days later the VRSA began to drag and upon investigation the motor generator and battery charger checked good but a cell check of 12 batteries revealed 10 were bad and two with very low cells. All 12 batteries were removed and replaced. Later that night channel 21 began reporting and the following day the maintenance team discovered that motor generator K-5 relay was faulty. The relay was replaced and channel 21 cleared. Seven of the 12 batteries were condemned. Proper and timely troubleshooting by the maintenance teams could have prevented some of the battery damage experienced in this mishap.

1980 Flying Safety Rate



MISHAPS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1979	1	0	0	1	0	0	0	1	2	0	0	0
1980	0	0	0	0	0	0	2					



MISHAP STATUS

KC-135A	JULY 80
FB-111A	JULY 80

BIG INSTRUMENT

QUESTIONS & ANSWERS

Here is a quick quiz to refresh your memory on a few instrument procedures. You can compare your answers to ours at the end of the article.

Captain John C. Conley
1st Combat Evaluation Group
Barksdale Air Force Base, Louisiana

1. If an aircraft is not capable of meeting a minimum climb rate for a SID, what alternatives does the pilot have?

2. You are receiving radar vectors to an ILS final that has a 2000 foot glide slope intercept altitude. You are at 2500 feet when cleared for the approach. Are you required to call departing 2500 feet?

3. You are flying at 9000 feet MSL and 240 KIAS when the controller requests and increase in airspeed of 30 knots. Should you comply?

4. You are climbing out of your departure base and the ATC controller advises you that you are in "Radar Contact." What does the term "Radar Contact" actually mean?

5. You divert into a base that has a Three Bar VASI system. Which VASI lights do you use for a normal landing glide slope?

6. Are stepdown altitudes allowed on surveillance radar approaches (ASR)?

7. At what point during a precision approach should you begin looking for the runway environment?

a. At the DH, and execute a missed approach if the runway environment is not in sight.

b. Prior to the DH, and execute a missed approach at the DH if the runway environment is not in sight.

8. Which one of the following holding instructions is valid?

a. Hold southeast of the 20 DME fix, 030° radial of the Decatur VORTAC, 10 mile legs, left turns.

b. Hold northwest of the 30 DME fix, Reese TACAN, 310° radial, 10 mile legs.

c. Hold northwest of the Barksdale TACAN, 34 DME fix, 005° radial, 8 mile legs, left turns.

d. Hold southwest of the Marion VOR on the 250° radial, 25 DME fix, 10 mile legs.

ANSWERS

1. You could select another SID with an acceptable gradient. You could possibly reduce the aircraft weight or request a VFR climb. It also should be cautioned that requesting a radar departure in lieu of a SID will not automatically solve the climb gradient problem because controllers do not necessarily know the climb capability of each individual aircraft. Also, there is no climb criteria considered on a radar departure. If you elect to use a radar departure, coordinate your requirements with the controlling agency before takeoff and maintain a clear mental picture of your aircraft position in relation to obstructions. (AFM 51-37, para 3-2c)

2. Yes. Additional reports in FLIP requires a call when vacating an assigned altitude when cleared for the approach. (FLIP General Planning, para 5-21)

3. No. Because AFM 60-16, FLIP General Planning, and FAR 91.70 limit aircraft IAS for operating below 10,000 feet MSL to 250 knots unless your flight manual requires a higher speed. The point is that the controller may not know your IAS when he makes the request and it is the pilot's responsibility to comply with the regulations. Advise the controller you are unable to comply with his request. (FLIP General Planning, para 5-40)

4. The term "Radar Contact" is used by ATC to inform an aircraft that it is identified on the radar display and radar flight following will be provided until radar identification is terminated. When a pilot is informed of "Radar Contact" he should know that he discontinues reporting over compulsory report points. That's all. (FLIP General Planning, para 2-31)

5. The Three Bar VASI systems are installed to accommodate jumbo aircraft (C-5As, 747s, etc.) Jumbo jets use the two far bars the same way as pilots who fly the two bar standard system. If you are not a jumbo jet pilot, then fly the first two bars as normal and ignore the far (third) bar. (AFM 51-37, para 6-20c(1)(g))

6. Yes. If a descent restriction exists, the controller will advise the pilot upon reaching the descent point to descend to the stepdown altitude. When the aircraft has passed the stepdown fix, the controller will advise the pilot to continue his descent to the MDA. A stepdown altitude associated with a published nonprecision approach to the same runway is a good clue there will probably be a descent restriction on the ASR approach. Pilots should be aware that if they choose to fly below a controller's recommended altitude that he could fly through the restricted altitude on his descent to the MDA. The pilot must level off at the descent restriction until cleared by the controller to the MDA.

7. The correct answer is "b". You should establish a systematic scan for the runway environment prior to reaching the DH. Remember the Decision Height (DH) is the altitude at which a missed approach *will* be initiated when either visual reference with the runway environment has not been established or the aircraft is not in a position to execute a safe landing. (AFM 51-37, para 6-17d)

8. The correct answer is "b". This is the only holding pattern that is given in the correct format for controller directed holding instructions. Also, it is the only holding instruction that makes flying sense. (AFM 51-37, para 5-4)

PROFESSIONAL PERFORMERS

SAFETY NCO

TSgt Patrick M. Coleman is named SAC NCO of the Month for sustained outstanding performance as the unit safety NCO, 91st SPS, Minot AFB. Sgt Coleman's enthusiastic and professional approach has contributed greatly to both his unit's safety program, and that of the base. His efforts to curb the traditional rise in AFMV mishaps this past winter were extremely effective. At the same time, minor unreportable vehicle mishaps were reduced. This is particularly noteworthy considering how vital motor vehicles are to the security police mission. He continually briefs at guardmounts and prepares a relevant informative presentation each month for commander's calls. On a monthly basis, he inspects the unit dormitory rooms for safety/fire infractions and is often found touring all the restricted areas day and night to insure that there are no potential hazards. Additionally, Sgt Coleman conducts an extremely active safety awareness program for preschool children, both on and off base. His record of accomplishments proves him to be a totally dedicated professional NCO who is highly deserving of recognition for a job well done.

MINUTEMAN CREW

The 341st SMW, Crew R-166, including 1Lt Thomas H. Tatum, Jr., MCCC, and 2Lt David M. Brazell, DMCCC, is SAC Missile Crew of the Month.

TITAN CREW

Crew R-106, 308th SMW, is Titan Crew of the Month. Crewmembers are: Capt Thomas E. Dillon, MCCC; 2Lt William H. Savey, Jr., DMCCC; TSgt Billie W. Sanders, MSAT; and Sgt Danny Martin, MFT.

Crew E-115: 916 AREFS, Travis AFB, L to R: Capt Michael L. Wolfert AC, 2 Lt Douglas F. Borter CP, Capt Gordon G. Bailey NAV, and TSgt Keith Taylor BO

FLYING CREW

The mission for crew E-115 was scheduled for number two in a heavyweight cell take-off and departure. This sortie was the copilot's second since graduating from CCTS. Several base personnel were also on board for an incentive flight. Shortly after S-1 speed, water injection failed on the number two engine. The throttle was advanced to dry EPR and take-off continued. Just after rotation, the RPM and EPR on number two engine rapidly rolled back. Almost immediately the fire warning light illuminated for that engine. The crew completed the emergency checklist and departed the planned departure route to avoid higher terrain. The boom operator confirmed the fire on number two engine and observed smoke still coming from the engine cowling and strut areas. With this additional information, Capt Wolfert decided to land the aircraft as soon as possible since all indications of fire still existed. The crew made an uneventful 3 engine landing at home station. The fire was extinguished prior to landing, but damaged the engine and cowlings extensively. Rapid and decisive action by Capt Wolfert and his crew during this inflight emergency assured a safe recovery for the aircraft, passengers, and crew.

MAINTENANCE MAN

Sergeant Michael W. Scruggs, 28th Avionics Maintenance Squadron, Ellsworth AFB, S. D., is SAC Maintenance Airman of the Month. Sergeant Scruggs was highly instrumental in the successful mission accomplishment during a B-52 deployment exercise to Andersen AFB. While at Andersen, he discovered that the servicing rig used on the B-52D defensive fire control system would not work on the B-52H model. He modified the rig and was able to maintain the gun turret operational on all the bombers. When three assigned aircraft arrived on Guam after an extended mission, he noted each had defective hydraulic power supplies which rendered the systems completely inoperative. He researched the schematic diagrams of the system and recommended a change to the flight operation of the system for extended missions. His recommended procedure was adopted locally and has reduced the number of hydraulic power supply failures by 30 percent. He performs his additional duties in the same professional manner and always demonstrates outstanding communicative abilities. Sergeant Scruggs' initiative, attention to detail, and enthusiastic performance of his duties make him an invaluable member of the Strategic Air Command and the United States Air Force.

WANTED
by
COMBAT CREW

Are you a top notch cartoonist-illustrator? Here's an opportunity to prove it as you expand your horizons!

The interesting and challenging position of Art Editor, Combat Crew, is now open to the airman that qualifies. If you would like to try for the position and work with a professional magazine staff, send examples of your cartooning illustrations to SAC/IGFC, Offutt AFB, NE, 68113. Do it now! The position never stays open long!!

MX

Continued from Page 16

a serious concern in virtually every aspect of the design process. Work environments, living conditions, family separation, recreation, training, evaluation, technical procedures, and a multitude of other areas are being integrated into the development process. Considering the large number of people required to operate and support M-X, human factors and overall quality of life are of paramount significance.

The Ballistic Missile Office (BMO) at Norton AFB, CA is responsible for developing and deploying M-X. BMO is currently guiding and integrating the efforts of over 25 contractors working at least as many facets of the weapon system. Although directly responsible to the Air Force Systems Command on M-X matters, BMO coordinates its efforts with other agencies and commands, particularly SAC, to insure requirements are satisfied and to benefit from many years of ICBM experience.

The Directorate of ICBM Requirements (XPQ) is the SAC Headquarters focal point for M-X. Operational requirements and concepts as well as studies on basing, manpower, mobility, preserving location uncertainty, survivability, etc., are XPQ's responsibility. XPQ works closely with the BMO and Air Staff to insure weapon system requirements are met and SAC concerns addressed.

The M-X is designed to counter an increasingly serious Soviet threat. As our newest strategic weapon system, it will revitalize the ICBM element of the TRIAD and strengthen our nuclear punch.

Maj Snyder was assigned to DCS/Plans at HQ Sac when he wrote this article. He has recently been assigned to MPC, Randolph AFB, as a missile career management staff officer.

SAC SAFETY SCREEN

380 BMW, Plattsburgh Crew E-09: P Capt Ronald J Frey, RN Capt Stanley J Gudmunson

380 BMW, Plattsburgh Crew R-77: P Capt Robert C Hinson, RN Capt Larry P Apel

310 AREFS, Plattsburgh Crew R-181: P Capt John F D Armstrong, CP Capt James T Hensel, N Lt Robert M Dugan, BO SSgt Edward G Sickenberger

380 AREFS, Plattsburgh Crew E-121: P Capt Thomas R Bayliss, CP Capt Henry C. Richard, N Capt Stephen D Lavendar, BO A1C Edmond Wolfkamp

2 BMW, Barksdale Crew E-73: P Capt James R Macon, CP Capt Paul A Grubbs, RN Lt Col David C Turner, N 1Lt Frank M Cranfill, EWO 2Lt Shane C Hedlund, G TSgt Kenneth R Stell

2 BMW, Barksdale Crew R-155: P Capt William R Halsey, CP Capt Alan W McElroy, N Capt William C Flickinger, BO SSgt George M Perez

2 BMW, Barksdale Crew R-112: P Capt John R Dockery, CP Capt Thomas L Rolinger Jr, N 1Lt Roy K Morris, BO SrA Patricia K Langham

11 AREFS, Altus Crew R-109: P Capt Daniel R Iken, CP Capt James J Kristl, N Capt Robert W Colvin, BO Amn Jeffery K Lowe

7 BMW, Carswell Crew R-12: P Capt Edward P Schoeck, CP 1Lt Terence G Young, RN Maj Arthur W Lund, N 1Lt John Q Barnard III, EWO 1Lt Robert J Donovan II, G Sgt Charles J Phillips

4200 TES, Edwards B-1 Crew: P Capt Larry D Autry, IOSO Lt Col John R Houle, OSO Maj Thomas W Alexander, DSO Maj Charles R Davis

22 BMW, March Crew E-33: P Capt Donald M Russell, CP Capt James L McGregor, RN Capt James R Prideaux, N Capt James H Pallazza, EW Capt Stanley H Eddleman, G SSgt Donald K Burks

96 BMW, Dyess Crew R-23: P Maj Walt Pool, CP 1Lt Dan Simpson, RN Maj Al Fernandez, N Capt D R Dakel, EW Maj Hugh Davidson, G Sgt Bud Toth

100 AREFW, Beale Crew E-159: P Capt Alan Featherstone, CP 1Lt Monty W Montgomery, N Capt Alexander Gebarski, BO SSgt Rudolph C Spence

28 BMW, Ellsworth Crew R-58: P Capt David L Eggers, CP Capt Vernon L Cosentino, CP 1Lt Eric J Peterson, RN Capt Paul E Seymour, NN Capt Carl T Smith, EW 1Lt Carl G Hawkins, G SSgt Leroy R Shook

6 SW, Eielson Crew E-16: TC Maj John T Nagy, ATS Capt John P Ward, ATS Capt John S Gunter Jr, MT Capt David L Woolkalis, R4 Capt Vincent E Lewis, PT SSgt Blair A Brandrup, ET MSgt George A Bender

6 SW, Eielson Crew E-07: P Capt Timothy O Lamons, CP Capt Richard A Rushenberg, N Capt Gordon S Alder, N Capt Bradley A Anderson

909 AREFS, Kadena Crew E-130: P Maj Kyle W Rensler, CP 1Lt Christopher L Manno, NN Capt Paul R Boggs, IS TSgt Michael H Strickland

44 SMW, Ellsworth Crew R-102: MCCC 1Lt Ronald G Maderas Jr, DMCCC 2Lt Gregory D Glover

91 SMW, Minot Crew R-132: MCCC 1Lt Michael J McPhail, DMCCC 2Lt Thomas A Torgerson

321 SMW, Grand Forks Crew R-123: MCCC 1Lt Roger H Ducy III, DMCCC 2Lt John A Rupp

351 SMW, Whiteman Crew E-134: MCCC 1Lt Melvin P Rhodes, DMCCC 2Lt Donald S Caccamise

The SAC Safety Screen is an honor roll of SAC's most professional crews. To gain listing on the Screen, crew members must be nominated by their unit commanders and meet high selection criteria of experience in their aircraft or missile system *IAW AFR 127-2/SS1.*

*U.S. Government Printing Office
1980—665—145/7

UNIVERSITY OF FLORIDA
3 1262 09304 9731

FL RE